

# ONVIF Test-tool Development and Implementation



## CUSTOMER:

The Open Network Video Interface Forum ([ONVIF](#)), industrial community



## INDUSTRY:

Video security technology

## CHALLENGE:

Our goal was to create a test tool and methodology to help companies who produce IP-cameras and other equipment for video surveillance and infrastructure systems ensure that their products comply with the established industry standard developed and distributed by the ONVIF community.

## PROBLEM STATEMENT:

For a long time, there were many private protocols for communication between IP-cameras and IP-recorders. So, each camera vendor provided their own protocol, so that recorder manufacturers and solution integrators had to support many different protocols for these devices. In 2008, the ONVIF open standard was introduced to the market to accelerate the adoption of network video in the security sector through a global open interface standard. In the middle of 2010 the ONVIF global member base had grown to over 200 companies. ONVIF's mission is to facilitate the development and usage of a global open standard for network video product interface. The ONVIF specification ensures interoperability between network video products regardless of manufacturer.

The ONVIF specification defines a common protocol on how network video devices should exchange information such as live or recorded video, audio, metadata, events, and control information. It becomes even easier for end users, integrators, consultants, and

manufacturers to tap the potential network video, offers resulting in more cost-effective and flexible solutions, expanded market opportunities, and reduced risk. The specification will also ensure that conformant devices are automatically discovered and connected to network applications, such as video management systems. ONVIF created special Test Tool utility to check conformance of ONVIF-compatible IP cameras from different producers. However, the standard ONVIF Test Tool had a lack of coverage, especially in negative tests, and was deemed not suitable for robustness testing. So, our team was selected as a software vendor for the new version of the Test Tool application. "Our team has extensive experience in infrastructure and system solutions for video surveillance and management systems, including ONVIF standard-based projects. So, we invited this vendor to create and implement a new-age Test Tool utility for our community and customer's needs," an ONVIF Representative said.

## SOLUTION:

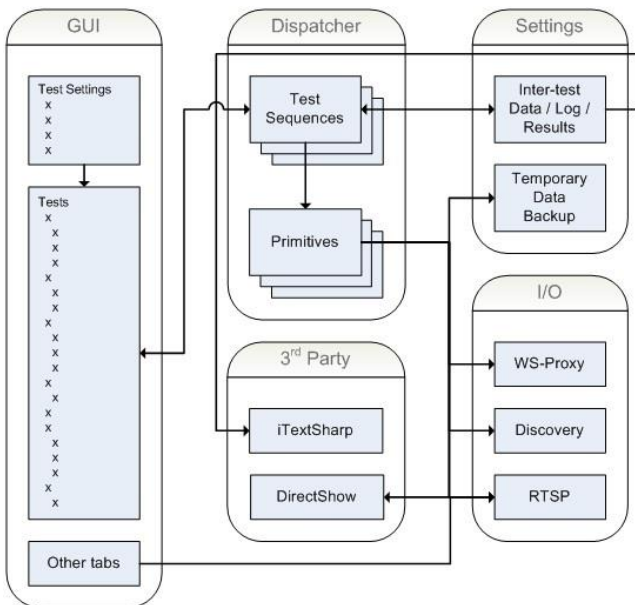
We had developed a set of interoperability tests with selected cameras (so called "Golden Units"), and with a dedicated camera simulator (also developed for this project). This simulator is essential for so-called "negative" tests, which test scenarios that cannot be covered with a properly working camera. Over the course of this ONVIF-related project, we ran full-coverage conformance tests and some important features:

- Running automatic or semi-automatic tests (from pre-command to full-circle)
- Creating reports with conformance errors highlighted (either in syntax, keywords or field values)
- Expandability (basing on schemes from original standard)
- Parameterization (for easy customization to particular product family)

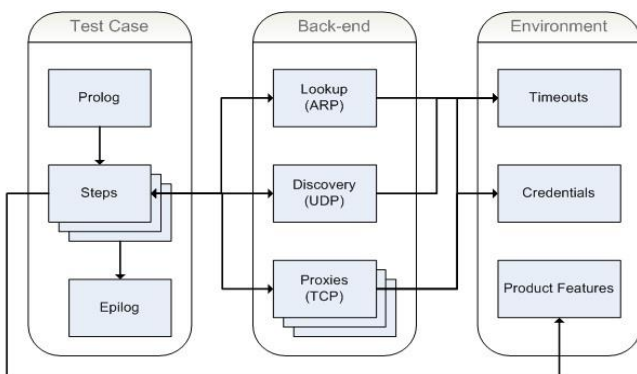
## RESULT

The implementation was finalized in close cooperation with ONVIF working groups and their members.

### ONVIF Test Tool, new version: solution architecture



### ONVIF Test Tool, new version: test-cases and processes



### Here's a brief list of implemented features:

- GUI framework
- Business-logic framework
- Test-cases (200+ by 2011, 1100+ by 2020, easy-expandable)
- Device Discovery
- Report engine
- Debugging facilities
- Audio-video streaming and decoding

### Activities:

- fine-tuning test cases
- specification verification
- introducing new tests

### Further activities

The ONVIF specification continues to evolve, as does the Device Test Tool does accordingly. From mid 2010, ONVIF moved to a twice-yearly release schedule, including service specifications, test specifications and Test Tool updates.

Our company has been on this schedule since 2010, supporting development of the Device Test Tool and its sister-project, the Client Test Tool. The Test Tool covers cameras, recorders, physical security devices, and VMSs.

## TOOLS AND TECHNOLOGIES

- Microsoft VS 2017 / .Net 4.5
- WinForms / BouncyCastle / live555 / DirectShow
- HTTP / XML / SOAP / ONVIF, RTP/ RTCP / RTSP / HTTP

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